If you are using a printed copy of this procedure, and not the on-screen version, then you <u>MUST</u> make sure the dates at the bottom of the printed copy and the on-screen version match.

The on-screen version of the Collider-Accelerator Department Procedure is the Official Version. Hard copies of all signed, official, C-A Operating Procedures are kept on file in the C-A ESHQ Training Office, Bldg. 911A

C-A OPERATIONS PROCEDURES MANUAL

4.120.18.i RHIC Roll-Up Tests

Text Page 2

Hand Processed Changes

HPC No.	<u>Date</u>	Page Nos.	<u>Initials</u>	
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		_		_
		_		_
	Approved:	<u>Signature on</u>		_
		Collider-Accelerator De	partment Chairman	Date

V. Castillo

PASS ANNUAL ACCEPTANCE TEST PROTOCOL

Division A Software Filename and Checksum: Title:	Checksum:
Division B Software Filename and Checksum: Title:	Checksum:
<u>Initial testing complete</u> :	
Test Team Leader's Name (Print):	Life Number:
Test Team Leader's Name (Sign):	
Acceptance test procedure complete (following repairs and retesting if rec	quired):
Test Team Leader's Name (Print):	Life Number:
Test Team Leader's Name (Sign):	Date:/
Test results reviewed by:	
Safety Section Head's Name (Print):	Life Number:
Safety Section Head's Name (Sign):	Date:/
Test results accepted by Radiation Safety Committee:	
RSC Member's Name (Print):	Life Number:
RSC Member's Name (Sign):	Date://

1.1 Confirm RF Supplies Enable in MODE 24

VERIFY	RF Transfer key is in MCR and is	CAPTURED
PLACE	Peer 9 in Controlled Access (Mode 16)	
VERIFY	MCR sees Peer 9 is in	MODE 16
CLOSE	Gate: 5GS1	
RESET	Gates: 3GI1, 3EL1, 4MD1, 4GE1, 4MD2, 4GE2, 4GI1, 4EL1,	
	4GE3, 4ED1	
VERIFY	Gates: 3GI1 \square , 3EL1 \square , 4MD1 \square , 4GE1 \square , 4MD2 \square , 4GE2 \square , 4GI1	
	□, 4EL1 □, 4GE3 □, 4ED1 □are	RESET
SWEEP	Zones: 4Z1 and 4Z2	
VERIFY	Zones: 4Z1 □ and 4Z2 □	SWEEP OK
VERIFY	3 ea #10 RF CA keys and 2 ea #11 RF Sweep keys are	CAPTURED
VERIFY	RF Key Tree Complete indicator is	ON
VERIFY	RF Reset indicator is	OFF
VERIFY	MCR sees on Summary Page CD1: A Div □, B Div □	SAFE
VERIFY	MCR sees on Summary Page CD2: A Div \Box , B Div \Box	SAFE
PLACE	Peer 9 in NO Access (Mode 24)	
VERIFY	MCR sees Peer 9 is in	MODE 24
VERIFY	MCR sees on Summary Page CD1: A Div □, B Div □	ENABLED
VERIFY	MCR sees on Summary Page CD2: A Div \Box , B Div \Box	ENABLED
REMOVE	LOTO from ACS Ckt Bkr Lockout Box (ACLB)	
VERIFY	ACLB is	NO LOTO
VERIFY	In Table-1 below, MCR sees on RF Critical Devices page	

RF Power Supply		D1-AC contator n SAFE to OFF		D2-DC Ross SAFE to OFF	Turn ON Ckt Bkr	Verify for Rl C kt. Bkr	
Kr Fower Suppry	A - Div	B - Div	A - Div	B - Div	for RF PS	A - Div	B - Div
Y04 – CAVA 3.1							
Y04 – CAVA 3.2							
B14 – CAVA 3.1							
B14 – CAVA 3.2							
Y04 – CAVS 3.1							
Y04 – CAVS 3.2							
Y04 – CAVS 3.3							
B14 – CAVS 3.1							
B14 - CAVS 3.2							
B14 – CAVS 3.3							
G4 – CAVSX 1							

RF Power Supply	•	D1-AC contator n SAFE to OFF	•	D2-DC Ross SAFE to OFF	Turn ON Ckt Bkr	Verify for RF Rchback Ckt. Bkr. is ON		
	A - Div	B - Div	A - Div	B - Div	for RF PS	A - Div	B - Div	
<u>G4 - CAVSX 2</u>								
G4 – CAVSX 3								
G4 – CAVSX 4								

Table – 1: Verification of CD1, CD2 and RF Power supplies Enabled in Mode 24

		Check for co	onfirmation RF Supplies Enable is possible in Mode 24.				
1.3	(Confirm delay	between disabling RF CD1 and RF CD2 is > 2 secs and < 4 secs				
		PLACE VERIFY	Peer 9 in NO Access (Mode 24) MCR sees Peer 9 is in	MODE 24			
		VERIFY VERIFY	MCR sees on Summary Page CD1: A Div \square , B Div \square MCR sees on Summary Page CD2: A Div \square , B Div \square	ENABLED ENABLED			
		VERIFY VERIFY	In RF Crit. Dev. Encl. 1004A A1 outputs: 0 =CD1 & 1 = CD2 are In RF Crit. Dev. Encl. 1004A B1 outputs: 0 =CD1 & 1 = CD2 are				
		REMOVE	Key from RF Key tree				
		VERIFY VERIFY	Time delay between A1 output 0 & 1 going OFF is Time delay between B1 output 0 & 1 going OFF is	>2 & <4 secs			
		Check for co	onfirmation of delay between disabling RF CD1 and RF CD2 is > 2 se	cs and < 4 secs			
			END OF TEST PROCEDURE				
TTL:	Sign	n for completi	on of initial testing:				
			Date:/	_/			
TTL:	Sign	n for complet	ion of final testing:				
			Date:/				

4.120.18.a.2 RHIC ROLL-UP RHIC INJECTION CD TESTS

PASS ANNUAL ACCEPTANCE TEST PROTOCOL

Division A Software Filename and Checksum: Title:	Checksum:
Division B Software Filename and Checksum: Title:	Checksum:
<u>Initial testing complete</u> :	
Test Team Leader's Name (Print):	Life Number:
Test Team Leader's Name (Sign):	Date://
Acceptance test procedure complete (following repairs and	retesting if required):
Test Team Leader's Name (Print):	Life Number:
Test Team Leader's Name (Sign):	Date://
<u>Test results reviewed by</u> :	
Safety Section Head's Name (Print):	Life Number:
Safety Section Head's Name (Sign):	Date://
Test results accepted by Radiation Safety Committee:	
RSC Member's Name (Print):	Life Number:
RSC Member's Name (Sign):	Date:/

1.1		S Interface Panel (AIP) Enable of Injection RchBack Critical Device Mode 24 is possible	s: PSUarc8 and
	STATION	ACS Person at A-Hse (PSUarc8) and 1000P (PSWarc20)	
	PLACE VERIFY	Peers 5, 7, 9, 11, 13, 15, 17 in Controlled Access (Mode16) MCR sees Peers 5 \square , 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square is in	MODE 16
	SWEEP VERIFY	All RHIC Zones All RHIC Zones are	SWEEP OK
	VERIFY VERIFY VERIFY	At A-Hse PSUarc8 Enable red bullseye on AIP is At 1000P PSWarc20 Enable red bullseye on AIP is MCR sees on CD page: Rhic Injn U/W	OFF OFF DISABLED
	PLACE VERIFY	Peers 5, 7, 9, 11, 13, 15, 17 in No Access (Mode24) MCR sees Peers 5 □, 7 □, 9 □, 11 □, 13 □, 15 □, 17 □ is in	MODE 24
	VERIFY VERIFY VERIFY	At A-Hse PSUarc8 Enable red bullseye on AIP is At 1000P PSWarc20 Enable red bullseye on AIP is MCR sees on CD page: Rhic Injn U/W	ON ON ENABLED
1.2	firm opening evices	a gate into the RHIC ring disables RHIC Injection Critical Devices &	& RHIC Critical
	STATION	ACS person at 1000P	
	VERIFY	MCR sees Peers 5 \square , 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square in	MODE 24
	VERIFY	MCR sees Permit Link for Peers 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square	ENABLED
	VERIFY VERIFY VERIFY VERIFY	At 1000P PSSwm Enable red bullseye on AIP is At 1000P PSXarc90 Enable red bullseye on AIP is At 1000P PSYarc90 Enable red bullseye on AIP is MCR sees on CD page: Rhic Injn X/Y A Div relay # 57 and B Div relay # 59 in encl 5602-1 in 1000P	ON ON ON ENABLED ON
	PRESS VERIFY VERIFY	RHIC Primary Beam Stop Withdraw in MCR MCR sees Primary Beam Shutters: G1BS, G2BS MCR sees RchBack Beam Shutter: G3BS	OUT OUT
	FOLLOW	Table – 1 below, pg 3	

Gate	Open then Close	Verify Peer moves to Mode 2	Verify Sweep lost	Verify Rhic Ijn CDs Disab. & B/eyes OFF	Verify RhBack CDs OK	Verify Rhic Ring BS G1& G2 IN	Verify Rhic Ring RhBack BS G3 OUT	Verify Permit Link Disab.	Verify relays 57&59 OFF	Verify attempt to w/draw BS G1 & G2 FAIL	Force Sweep	Go to Mode 24	Verify Permit Link Enab.	Verify Rhic Ijn CDs Enab. & B/eyes ON	W/draw Rhic Ring BS G1 & G2	Go to next gate
12GE1																
2GE1																
2GE2																
4GE2																
4GE3																
5GE1																
YGI1																
6GE2																
XGI1																
6GE3																
7GE1																
8GE1																
8GE2																
10GE1																End of test

Table – 1: Test of gate-opening into the RHIC ring disables RHIC Injection Critical Devices & RHIC Critical Devices

□ Check for confirmation of opening a gate into the RHIC ring disables RHIC Injection Critical Devices & RHIC Critical Devices

END OF TEST PROCEDURE

TTL: Sign for completion of initial testing:			
	Date:	_/	_/
TTL: Sign for completion of final testing:			
	Date:	1	/

4.120.18.a.3 RHIC ROLL-UP REACHBACK CRITICAL DEVICE TESTS

PASS ANNUAL ACCEPTANCE TEST PROTOCOL

Division A Software Filename and Checksum: Title:	Checksum:					
Division B Software Filename and Checksum: Title:	Checksum:					
<u>Initial testing complete</u> :						
Test Team Leader's Name (Print):	Life Number:					
Test Team Leader's Name (Sign):	Date://					
Acceptance test procedure complete (following repairs and retest	ang ir requirea):					
Test Team Leader's Name (Print):	Life Number:					
Test Team Leader's Name (Sign):	Date://					
Test results reviewed by:						
Safety Section Head's Name (Print):	Life Number:					
Safety Section Head's Name (Sign):	Date://					
<u>Test results accepted by Radiation Safety Committee</u> :						
RSC Member's Name (Print):	Life Number:					
RSC Member's Name (Sign):	Date:/					

${\bf 1.1} Confirm\ interrupting\ readback\ signal\ from\ PSSWM\ causes\ a\ Rchback;\ restore\ operation$				
		PLACE VERIFY	Peers 7, 9, 11, 13, 15, 17 in Restricted Access (Mode 8) MCR sees Peers 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square is in	MODE 8
		VERIFY	MCR sees: PSUARC8 □, PSWARC20 □ are	DISABLED
		REMOVE	Readback relay, K1 , for PSSWM in CD Inface Box for X,Y& SwM encl 5611in 1000P	
		VERIFY VERIFY	MCR sees Div A □, Div B □ MCR sees: PSUARC8 □, PSWARC20 □ are	Reachback DISABLED
		REPLACE	Readback relay, K1 , for PSSWM in CD Inface Box for X,Y& SwM encl 5611in 1000P	
		RESET	Reachback in MCR	
		VERIFY VERIFY	MCR sees Div A □, Div B □ RchBack MCR sees: PSUARC8 □, PSWARC20 □ are	Reachback OK DISABLED
		Check for operation	confirmation of interrupting readback signal from PSSM causes a Ro	chback; restore
1.2	Con	firm interrup	ting readback signal from PSXARC90 causes a Rchback; restore ope	ration
		PLACE VERIFY	Peers 7, 9, 11, 13, 15, 17 in Restricted Access (Mode 8) MCR sees Peers 7 □, 9 □, 11 □, 13 □, 15 □, 17 □ is in	MODE 8
		VERIFY	MCR sees: PSUARC8 □, PSWARC20 □ are	DISABLED
		REMOVE	Readback relay, K2 , for PSXARC90 in CD Inface Box for X,Y&SwM , encl 5611in 1000P	
		VERIFY	MCR sees Div A □, Div B □	Reachback
		VERIFY	MCR sees: PSUARC8 □, PSWARC20 □ are	DISABLED
		REPLACE	Readback relay, K2 , for PSXARC90 in CD Inface Box for X,Y& SwM , encl 5611 in 1000P	
		RESET	Reachback in MCR	
		VERIFY VERIFY	MCR sees Div A □, Div B □ RchBack MCR sees: PSUARC8 □, PSWARC20 □ are	Reachback OK DISABLED
		Check for c restore ope	onfirmation of interrupting readback signal from PSXARC90 causes ration.	a Rchback;

1.3	1.3 Confirm interrupting readback signal from PSYARC90 causes a Rchback; restore operation				
		PLACE VERIFY	Peers 7, 9, 11, 13, 15, 17 in Restricted Access (Mode 8) MCR sees Peers 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square is in	MODE 8	
		VERIFY	MCR sees: PSUARC8 □, PSWARC20 □ are	DISABLED	
		REMOVE	Readback relay, K3, for PSYARC90 in CD Inface Box for X,Y&SwM, encl 5611in 1000P		
		VERIFY VERIFY	MCR sees Div A □, Div B □ MCR sees: PSUARC8 □, PSWARC20 □ are	Reachback DISABLED	
		REPLACE	Readback relay, K3 , for PSYARC90 in CD Inface Box for X,Y& SwM , encl 5611 in 1000P		
		RESET	Reachback in MCR		
		VERIFY VERIFY	MCR sees Div A □, Div B □ RchBack MCR sees: PSUARC8 □, PSWARC20 □ are	Reachback OK ENABLED	
		Check for cooperation	onfirmation of interrupting readback signal from PSYARC90 cause	es a Rchback; restore	
1.4	Co	onfirm normal	operation of Primary & Rchback Beam Stops in Mode 24		
		PLACE VERIFY	Peers 5 in Controlled Access (Mode16) MCR sees Peers 5 is in	MODE 16	
		SWEEP	Zones: W, X & Y		
		VERIFY VERIFY	Zones: W, X & Yare 4 ea #12 Inj CA keys and 2 ea #13 Inj Sweep keys are	SWEEP OK CAPTURED	
		PLACE VERIFY	Peer 5 in No Access (Mode 24) Peer 5 is in	MODE 24	
		VERIFY	MCR sees PSUARC8	ENABLED	
		VERIFY	MCR sees PSWARC20	ENABLED	
		PLACE VERIFY	Peers 7, 9, 11, 13, 15, 17 in Controlled Access (Mode 16) MCR sees Peers 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square in	MODE 16	
		SWEEP	All RHIC Zones	~	
		VERIFY VERIFY	All RHIC Zones are 24 ea #14 RHIC CA keys & 6 ea #15 RHIC Sweep keys are	SWEEP OK CAPTURED	
		VERIFY	3 ea #10 RF CA keys and 2 ea #15 RF Sweep keys are	CAPTURED	
		PLACE VERIFY	Peer 7, 9, 11, 13, 15, 17 in No Access (Mode 24) MCR sees Peers 7 □, 9 □, 11 □, 13 □, 15 □, 17 □ in	MODE 24	
		VERIFY	MCR sees Primary Beam Stops: G1BS □, G2BS □	IN	
		VERIFY	MCR sees Rchback Beam Stop: G3BS	OUT	
		VERIFY VERIFY	Visually through viewport Prim Beam Stop G12-bsx.1 is Visually through viewport Prim Beam Stop G12-bsx.2 is	IN IN	
		VERIFY VERIFY	Visually through viewport Rehback Beam Stop G12-bsx.3 is	OUT	
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	PRESS	Beam Stop Withdraw Button at MCR	
	VERIFY	MCR sees Primary Beam Stops: G1BS □, G2BS □	OUT
	VERIFY	MCR sees Rchback Beam Stop: G3BS	OUT
	VERIFY	Visually through viewport Prim Beam Stop G12-bsx.1 is	OUT
	VERIFY	Visually through viewport Prim Beam Stop G12-bsx.2 is	OUT
	VERIFY	Visually through viewport Rchback Beam Stop G12-bsx.3 is	OUT
	REMOVE	Any CA key from the RHIC key tree	
	VERIFY	MCR sees Peers 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square is in	MODE 2
	VERIFY	MCR sees Primary Beam Stops: G1BS □, G2BS □	IN
	VERIFY	MCR sees Rchback Beam Stop: G3BS	OUT
	VERIFY	Visually through viewport Prim Beam Stop G12-bsx.1 is	IN
	VERIFY	Visually through viewport Prim Beam Stop G12-bsx.2 is	IN
	VERIFY	Visually through viewport Rchback Beam Stop G12-bsx.3 is	OUT
	Check fo	r confirmation of normal operation of Primary & Rchback Beam	Stops in Mode 24
1.5	onfirm removi reachback	ng readback signal from Prim Beam Stop G12-bsx.1 causes a reac	hback; clear
	PLACE VERIFY	Peers 7, 9, 11, 13, 15, 17 in Restricted Access (Mode 8) MCR sees Peers 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square is in	MODE 8
	REMOVE	Connector from Div A Prim Beam Stop G12-bsx.1	
	VERIFY	MCR sees RHIC Reachback is	Reachback
	VERIFY	MCR sees Primary Beam Stops: G1BS □, G2BS □	IN
	VERIFY	MCR sees Rchback Beam Stop: G3BS	IN
	VERIFY	Visually through viewport Prim Beam Stop G12-bsx.1 is	IN
	VERIFY	Visually through viewport Prim Beam Stop G12-bsx.2 is	IN
	VERIFY	Visually through viewport Rchback Beam Stop G12-bsx.3 is	IN
	REPLACE RESET	Connector on Prim Beam Stop G12-bsx.1 RHIC Reachback	
	VERIFY	MCR sees RHIC Reachback is	Reachback ok
	VERIFY	MCR sees Primary Beam Stops: G1BS □, G2BS □	IN
	VERIFY	MCR sees Rchback Beam Stop: G3BS	OUT
	VERIFY	Visually through viewport Prim Beam Stop G12-bsx.1 is	IN
	VERIFY	Visually through viewport Prim Beam Stop G12-bsx.2 is	IN
	VERIFY	Visually through viewport Rchback Beam Stop G12-bsx.3 is	OUT
		onfirmation of removing readback signal from Prim Beam Stop G clear reachback	12-bsx.1 causes a

1.6		onfirm remov eachback	ing readback signal from Prim Beam Stop G12-bsx.2 causes a reachba	ack; clear
		PLACE VERIFY	Peers 7, 9, 11, 13, 15, 17 in Restricted Access (Mode 8) MCR sees Peers 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square is in	MODE 8
		REMOVE	Connector from Div B Prim Beam Stop G12-bsx.2	
		VERIFY VERIFY	MCR sees RHIC Reachback is MCR sees W Reachback is	Reachback Reachback
		VERIFY VERIFY VERIFY VERIFY VERIFY REPLACE RESET	MCR sees Primary Beam Stops: G1BS □, G2BS □ MCR sees Rchback Beam Stop: G3BS Visually through viewport Prim Beam Stop G12-bsx.2 is Visually through viewport Prim Beam Stop G12-bsx.2 is Visually through viewport Rchback Beam Stop G12-bsx.3 is Connector on Prim Beam Stop G12-bsx.2 RHIC and W Reachbacks	IN IN IN IN
		VERIFY	MCR sees RHIC □ and W □ Reachback are	Reachback ok
			MCR sees Primary Beam Stops: G1BS □, G2BS □ MCR sees Rchback Beam Stop: G3BS Visually through viewport Prim Beam Stop G12-bsx.2 is Visually through viewport Prim Beam Stop G12-bsx.2 is Visually through viewport Rchback Beam Stop G12-bsx.3 is onfirmation of removing readback signal from Prim Beam Stop G12-bear reachback	IN OUT IN IN OUT OSX.2 causes a
			END OF TEST PROCEDURE	
TTL:	Sign	ı for completic	on of initial testing:	
TTL:	Sign	ı for completi	Date:/ on of final testing:	
			Date:/	/

4.120.18.a.4 RHIC ROLL-UP INJECTION CRITICAL DEVICE TESTS

PASS ANNUAL ACCEPTANCE TEST PROTOCOL

Division A Software Filename and Checksum: Title:	Checksum:		
Division B Software Filename and Checksum: Title:	Checksum:		
<u>Initial testing complete</u> :			
Test Team Leader's Name (Print):	Life Number:		
Test Team Leader's Name (Sign):			
Acceptance test procedure complete (following repairs and re	etesting if required):		
Test Team Leader's Name (Print):	Life Number:		
Test Team Leader's Name (Sign):	Date:/		
<u>Test results reviewed by</u> :			
Safety Section Head's Name (Print):	Life Number:		
Safety Section Head's Name (Sign):	Date:/		
Test results accepted by Radiation Safety Committee:			
RSC Member's Name (Print):	Life Number:		
RSC Member's Name (Sign):	Date: / /		

1.1			4 removal of 24VDC from Block A1 in CD Box at 1012A drops the po Ds, Rhic Ijn CDs, Permit Link and causes a NG CDEVRIO	eer to Mode 2,
		PLACE VERIFY	Peer 13 in No Access (Mode 24) Peer 13 is in	MODE 24
		WAIT	For Beam Imminent Alarms to stop sounding	
		PRESS	RHIC Primary Beam Stop withdraw button in MCR	
		VERIFY	MCR sees Primary Beam Stop: G1BS: Div A □, Div B □	OUT
		VERIFY	MCR sees Primary Beam Stop: G2BS: Div A □, Div B □	OUT
		VERIFY	MCR sees PSSWM	ENABLED
		VERIFY	MCR sees PSXARC90	ENABLED
		VERIFY	MCR sees PSYARC90	ENABLED
		VERIFY	MCR sees Peer 13 Permit Link: Div A \square , Div B \square	ENABLED
		REMOVE	24VDC to Block A1 , in CD Box at 1012A	
		VERIFY	MCR sees at Ijn Hw CDev RIO: Div A	NG Hw
		VERIFY	Peer 13 Div A is in	MODE 2
		VERIFY	MCR sees Primary Beam Stop: G1BS	$A \neq B$
		VERIFY	MCR sees Primary Beam Stop: G2BS	A ≠ B
		VERIFY	MCR sees PSSWM	DISABLED
		VERIFY	MCR sees PSXARC90	DISABLED
		VERIFY	MCR sees PSYARC90	DISABLED
		VERIFY	MCR sees Peer 13 Permit Link: Div A □ & Div B □	DISABLED
		VERIFY VERIFY	MCR sees W □ & Rhic □ Reachback MCR sees G3 BS	Reachback IN
		REPLACE	24VDC to Block A1, 1012A	
		RESET VERIFY	NG CDev RIO MCR sees at Ijn Hw CDev RIO: Div A	ОК
		RESET	W & Rhic Reachbacks	OK
		VERIFY	MCR sees W \(\triangle \) & Rhic \(\triangle \) Reachback	OK
	Ц	VEXII I	WER SEES W & RIIIC REactiback	OK
			onfirmation of Mode 24 removal of 24VDC from Block A1 in cd Box o Mode 2, disables: Rhic CDs, Rhic Ijn CDs, Permit Link and causes	, <u> </u>
1.2			24 removal of Remote I/O cable from Scanner Module in Peer 13A at 2, disables: Rhic CDs, Rhic Ijn CDs, Permit Link and causes a NG	
	П	PLACE VERIFY	Peer 13 in No Access (Mode 24) Peer 13 is in	MODE 24
		WAIT	For Beam Imminent Alarms to stop sounding	
		PRESS	RHIC Primary Beam Stop withdraw button in MCR	
		VERIFY	MCR sees Primary Beam Stop: G1BS: Div A □, Div B □	OUT
	П	VERIFY	MCR sees Primary Beam Stop: G2BS: Div A □, Div B □	OUT
		VERIFY	MCR sees PSSWM	ENABLED
		VERIFY	MCR sees PSXARC90	ENABLED
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	VERIFY	MCR sees PSYARC90	ENABLED
П	VERIFY	MCR sees Peer 13 Permit Link: Div A □ & Div B □	ENABLED
_		21, 22 CT 3000 2 CO 10 10 10 10 10 10 10 10 10 10 10 10 10	
	UNPLUG	Remote I/O cable from Scanner module Peer 13A	
	VERIFY	MCR sees at Ijn Hw CDev RIO: Div A	NG Hw
	VERIFY	Peer 13 Div A is in	MODE 2
	VERIFY	MCR sees Primary Beam Stop: G1BS	$A \neq B$
	VERIFY	MCR sees Primary Beam Stop: G2BS	$A \neq B$
	VERIFY	MCR sees PSSWM	DISABLED
	VERIFY	MCR sees PSXARC90	DISABLED
	VERIFY	MCR sees PSYARC90	DISABLED
	VERIFY	MCR sees Peer 13 Permit Link: Div A □ & Div B □	DISABLED
	VERIFY	MCR sees W Reachback	Reachback
	REPLACE	Remote I/O cable in Scanner module Peer 13A	
	RESET	NG CDev RIO	
	VERIFY	MCR sees at Ijn Hw CDev RIO: Div A	OK
	RESET	W Reachback	
	VERIFY	MCR sees W Reachback	OK
		4 removal of 24VDC from Block B1 in CD Box at 1012A drops	the peer to Mode 2,
a		Ds, Rhic Ijn CDs, Permit Link and causes a NG CDev RIO	
	PLACE VERIFY	Peer 13 in No Access (Mode 24) Peer 13 is in	MODE 24
	VEXIF 1	1 cc1 13 18 III	MODE 24
	WAIT	For Beam Imminent Alarms to stop sounding	
	PRESS	RHIC Primary Beam Stop withdraw button in MCR	
	VERIFY	MCD coop Drimour, Doom Ston, C1DS, Div. A D. Div. D.	OUT
	VERIFY	MCR sees Primary Beam Stop: G1BS: Div A \square , Div B \square	OUT OUT
		MCR sees Primary Beam Stop: G2BS: Div A □, Div B □ MCR sees PSSWM	
	VERIFY		ENABLED ENABLED
	VERIFY	MCR sees PSXARC90 MCR sees PSYARC90	ENABLED ENABLED
	VERIFY		ENABLED ENABLED
	VERIFY	MCR sees RHIC Permit Link: Div A □ & Div B □	ENABLED
	REMOVE	24VDC to Block B1, 1012A	
	VERIFY	MCR sees at Ijn Hw CDev RIO: Div B	NG Hw
	VERIFY	Peer 13 Div B \(\text{\tinte\tint{\text{\tinc{\text{\tinc{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tint{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tinte\tint{\text{\text{\text{\text{\text{\text{\text{\text{\til\text{\texi}\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\texi}\text{\text{\text{\text{\text{\text{\text{\text{\texi}\tint{\text{\texit{\tet{\text{\text{\text{\text{\text{\texi}\text{\texit{\text{\t	MODE 2
	V EXII 1	Teel 13 Div D & Div A are m	MODE 2
	VERIFY	MCR sees Primary Beam Stop: G1BS	$A \neq B$
	VERIFY	MCR sees Primary Beam Stop: G2BS	$\mathbf{A} \neq \mathbf{B}$ $\mathbf{A} \neq \mathbf{B}$
	VERIFY	MCR sees PSSWM	DISABLED
	VERIFY	MCR sees PSXARC90	
		THE CAL BOOK A DIRITATE OF W	
		MCR sees PSYARC90	DISABLED
	VERIFY	MCR sees PSYARC90 MCR sees RHIC Permit Link: Div R	DISABLED DISABLED
	VERIFY VERIFY	MCR sees RHIC Permit Link: Div B	DISABLED DISABLED DISABLED
	VERIFY		DISABLED DISABLED

	REPLACE	24VDC to Block B1, 1012A	
	RESET	NG CDev RIO	
	VERIFY	MCR sees at Ijn Hw CDev RIO: Div A	OK
	RESET	W & Rhic Reachbacks	
	VERIFY	MCR sees W \(\text{\text{\text{\text{\$\color{10}{10}\$}}} & Rhic \(\text{\text{\$\color{10}\$}} \) Reachback	OK
		confirmation of Mode 24 removal of 24VDC from Block B1 in eer to Mode 2, disables: Rhic CDs, Rhic Ijn CDs, Permit Link a	
1.4		e 24 removal of Remote I/O cable from Scanner Module in Peer e 2, disables: Rhic CDs, Rhic Ijn CDs, Permit Link and causes	
	PLACE	Peer 13 in No Access (Mode 24)	
	VERIFY	Peer 13 is in	MODE 24
	WAIT	For Beam Imminent Alarms to stop sounding	
	PRESS	RHIC Primary Beam Stop withdraw button in MCR	
	VERIFY	MCR sees Primary Beam Stop: G1BS: Div B □, Div B □	OUT
	VERIFY	MCR sees Primary Beam Stop: G2BS: Div B □, Div B □	OUT
	VERIFY	MCR sees PSSWM	ENABLED
	VERIFY	MCR sees PSXARC90	ENABLED
	VERIFY	MCR sees PSYARC90	ENABLED
	VERIFY	MCR sees RHIC Permit Link: Div A □ & Div B □	ENABLED
	UNPLUG	Remote I/O cable from Scanner module Peer 13B	
	VERIFY	MCR sees at Ijn Hw CDev RIO: Div B	NG Hw
	VERIFY	Peer 13 Div A □ & Div B □ are in	MODE 2
	VERIFY	MCR sees Primary Beam Stop: G1BS	$\mathbf{A} \neq \mathbf{B}$
	VERIFY	MCR sees Primary Beam Stop: G2BS	$A \neq B$
	VERIFY	MCR sees PSSWM	DISABLED
	VERIFY	MCR sees PSXARC90	DISABLED
	VERIFY	MCR sees PSYARC90	DISABLED
	VERIFY	MCR sees RHIC Permit Link: Div A □ & Div B □	DISABLED
	VERIFY	MCR sees W □ & Rhic □ Reachback	Reachback
	REPLACE	Remote I/O cable in Scanner module Peer 13B	
	RESET	NG CDev RIO	
	VERIFY	MCR sees at Ijn Hw CDev RIO: Div A	OK
	RESET	W & Rhic Reachbacks	
	VERIFY	MCR sees W □ & Rhic □ Reachback	OK
		nfirmation in Mode 24 removal of Remote I/O cable from Scan A, drops the peer to Mode 2, disables: Rhic CDs, Rhic Ijn CDs & CDev RIO	

END OF TEST PROCEDURE

TTL: Sign for completion of initial testing:				
	Date:	/_	/	
TTL: Sign for completion of final testing:				
	Date:	/	1	

4.120.18.j.1 RHIC ROLL-UP RF KEYTREE TESTS

PASS ANNUAL ACCEPTANCE TEST PROTOCOL

Division A Software Filename and Checksum: Title:	Checksum:
Division B Software Filename and Checksum: Title:	Checksum:
Initial testing complete:	
Test Team Leader's Name (Print):	Life Number:
Test Team Leader's Name (Sign):	Date://
Acceptance test procedure complete (following repairs and a	rotecting if required).
Acceptance test procedure complete (following repairs and i	retesting if required).
Test Team Leader's Name (Print):	Life Number:
Test Team Leader's Name (Sign):	Date: / /
Test Team Beauti 51 (ame (5.ga))	
Test results reviewed by:	
Safety Section Head's Name (Print):	Life Number:
Safety Section Head's Name (Sign):	Date:/
Test results accepted by Radiation Safety Committee:	
RSC Member's Name (Print):	Life Number:
RSC Member's Name (Sign):	Date://

1.1	1.1 Confirm Remote Reset function of the RF Key Tree from MCR				
		VERIFY	RF Transfer key is in MCR and is	CAPTURED	
		PLACE	Peer 9 in Safe Access (Mode 2)		
		VERIFY	MCR sees Peer 9 is in	MODE 2	
		VERIFY	3 ea #10 RF CA keys & 2 ea #11 RF Sweep keys are	CAPTURED	
		VERIFY	RF Key Tree Complete indicator is	ON	
		VERIFY	RF Reset indicator is	OFF	
		REMOVE	The last #11 Sweep Key		
		VERIFY	RF Key Tree Complete indicator is	OFF	
		VERIFY	RF Reset indicator is	OFF	
		CAPTURE	The last #11 Sweep Key		
		VERIFY	RF Key Tree Complete indicator is	OFF	
		VERIFY	RF Reset indicator is	ON	
		VERIFY	Attempt to reset gate 4GE2	FAIL	
		PLACE	Peer 9 in Restricted Access (Mode 8)		
		VERIFY	MCR sees Peer 9 is in	MODE 8	
		VERIFY	Attempt to reset gate 4GE2	FAIL	
		PLACE	Peer 9 in Controlled Access (Mode 16)		
		VERIFY	MCR sees Peer 9 is in	MODE 16	
		VERIFY	Attempt to reset gate 4GE2 is	SUCCESSFUL	
			confirmation of Remote Reset function of the RF Key Tree from MCF		
1.2	C	onfirm norma	al move to MODE 24 and MODE 26 is possible.		
		PLACE	Peer 9 in Controlled Access (Mode 16)		
		VERIFY	MCR sees Peer 9 is in	MODE 16	
		CLOSE	Gate 5GS1		
		RESET	Gates: 3GI1, 3EL1, 4MD1, 4GE1, 4MD2, 4GE2, 4GI1, 4EL1, 4GE3, 4ED1		
		VERIFY	Gates: 3GI1 🗆, 3EL1 🗆, 4MD1 🗆, 4GE1 🗀, 4MD2 🗀, 4GE2 🗀, 4GI1	RESET	
			□, 4EL1 □, 4GE3 □, 4ED1 □ are		
		SWEEP	Zones: 4Z1 , 4Z2		
		VERIFY	Zones: 4Z1 □, 4Z2 □ are	SWEPT	
		VERIFY	3 ea #10 RF CA keys and 2 ea #11 RF Sweep keys are	CAPTURED	
		VERIFY	RF Key Tree Complete indicator is	ON	
		VERIFY	RF Reset indicator is	OFF	
		VERIFY	Attempt to place Peer 9 in No Access (Mode 24) is	SUCCESSFUL	
		PLACE	Peer 9 in Controlled Access (Mode 16)		
		VERIFY	MCR sees Peer 9 is in	MODE 16	
		VERIFY	Attempt to place Peer 9 in RF No Access (Mode 26) is	SUCCESSFUL	
		PLACE	Peer 9 in Controlled Access (Mode 16)		
		VERIFY	MCR sees Peer 9 is in	MODE 16	
		Check for	r confirmation of normal move to MODE 24 and MODE 26 is possible	•	

1.3 Con	irm RF Key	Tree com	plete is necessary	y for move to	MODE 24 or	MODE 26
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PLACE Peer 9 in Controlled Access (Mode 16)

∨ERIFY MCR sees Peer 9 is in
FOLLOW Table 1 below

MODE 16

Key	Turn Key to OFF position	Verify Key Active light ON	Verify Reset light OFF	Verify Key Tree Complete Light OFF	Verify cannot go into Mode 24	Verify cannot go into Mode 26	Turn Key to ON position
RF CA #1							
RF CA #2							
RF CA #3							
RF Sweep #1							
RF Sweep #2							

Table - 1: Test of RF Key Tree Complete is necessary for move to Mode 24 or Mode 26

☐ Check for confirmation of RF Key Tree complete is necessary for move to MODE 24 or MODE 26

1.4 Confirm in Mode 24 removal of key from RF Key Tree will drop Peer 9 to Mode 2

PLACE Peer 9 in No Access (Mode 24)

□ VERIFY MCR sees Peer 9 in

MODE 24

FOLLOW Table 2 below

	Peer 9 to Mode 24	Turn key OFF	Verify Key Active light ON	Verify Key Tree Complete Light OFF	Verify Peer 9 moved to Mode 2	Turn key ON	Verify Key Active light OFF	Verify Key Tree Complete Light ON
RF CA #1								
RF CA #2								
RF CA #3								
RF Sweep #1								
RF Sweep #2								

Table - 2: In Mod 24 test of removal of key from RF Key Tree

☐ Check for confirmation in Mode 24 removal of key from RF Key Tree will drop Peer 9 to Mode 2

1.5 Confirm in Mode 26 removal of key from RF Key Tree will drop Peer 9 to Mode 2

Peer 9 in RF No Access (Mode 26)

PLACE

□ VERIFY MCR sees Peer 9 in

FOLLOW Table 3 below **MODE 26**

	Peer 9 to Mode 26	Turn key OFF	Verify Key Active light ON	Verify Key Tree Complete Light OFF	Verify Peer 9 moved to Mode 2	Turn key ON	Verify Key Active light OFF	Verify Key Tree Complete Light ON
RF CA #1								
RF CA #2								
RF CA #3								
RF Sweep #1								
RF Sweep #2								

Table - 3 In Mode 26 test of removal of key from RF Key Tree

	Check for conf	irmation in M	Iode 26 remova	ıl of key fron	ı RF Key Tro	ee will drop l	Peer 9 to Mo	de 2
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1.6 Confirm Excess #11 RF Sweep key at MCR will drop Peer 9 from Mode 24 to Mode 2

PLACE VERIFY	Peer 9 in No Access (Mode 24) MCR sees Peer 9 in	MODE 24
VERIFY VERIFY	RF Key Tree Complete indicator is RF Reset indicator is	ON OFF
ATTEMPT	To turn excess #11 RF Sweep key in Reset tumbler at MCR	
VERIFY REMOVE Check for o	MCR sees Peer 9 moved to Excess #11 RF Sweep key from Reset tumbler confirmation of excess #11 RF Sweep key at MCR will drop Peer 9	MODE 2 from Mode 24 to
Mode 2		

1.7 Confirm Excess #11 RF Sweep key at MCR will drop Peer 9 from Mode 26 to Mode 2

PLACE VERIFY	Peer 9 in No Access (Mode 26) MCR sees Peer 9 in	MODE 26
VERIFY VERIFY	RF Key Tree Complete indicator is RF Reset indicator is	ON OFF
ATTEMPT	To turn excess #11 RF Sweep key in Reset tumbler at MCR	
VERIFY	MCR sees Peer 9 moved to	MODE 2

REMOVE Excess #11 RF Sweep key from Reset tumbler

 $\hfill\Box$ Check for confirmation of excess #11 RF Sweep key at MCR will drop Peer 9 from Mode 26 to Mode 2

Key PL.	ACEPeers in A	Alk PeQFF in MCR sees	Active Restricted A Peers: 5 □, 7	F KayıJ Kay ir Tree AceasapMadede light_OII _	Mode 8 all Peers remain h Mode , 13 \$\overline{1}, 15	Turn key ON □, 17 □ i	Verify Key Active light OFF n MODI	Verify Key Tree Complete Slight ON	Next key
RF CA #P	LLOW _D 7	Fable 4 bel	ow \square						
RF CA #2									
<u>RF CA #3</u>									
RF CA #4									
RF CA #5									
RF CA #6									
RF Sweep #1									
RF Sweep #2									End of test

Table - 4 Test in Mode 8 of keyswitch integrity of keys in RF Key Tree

☐ Check for acceptance of Confirm keyswitch integrity of keys in RF Key Tree in Mode 8

END OF TEST PROCEDURE

TTL: Sign for completion of initial testing:	
	Date://
TTL: Sign for completion of final testing:	
	Date: /

4.120.18.j.2 RHIC ROLL-UP RHIC KEYTREE TESTS

PASS ANNUAL ACCEPTANCE TEST PROTOCOL

Division A Software Filename and Checksum: Title:	Checksum:
Division B Software Filename and Checksum: Title:	Checksum:
Initial testing complete:	
Test Team Leader's Name (Print):	Life Number:
Test Team Leader's Name (Sign):	Date://
Acceptance test procedure complete (following repairs and a	rotecting if required).
Acceptance test procedure complete (following repairs and i	retesting if required).
Test Team Leader's Name (Print):	Life Number:
Test Team Leader's Name (Sign):	Date: / /
Test Team Beauti 51 (ame (5.ga))	
Test results reviewed by:	
Safety Section Head's Name (Print):	Life Number:
Safety Section Head's Name (Sign):	Date:/
Test results accepted by Radiation Safety Committee:	
RSC Member's Name (Print):	Life Number:
RSC Member's Name (Sign):	Date://

1.1 Confirm Remote Reset function of the RHIC Key Tree from MCR

VERIFY	RF Transfer key is in MCR and is	CAPTURED
VERIFY VERIFY VERIFY	24 ea #14 RHIC CA keys & 6 ea #15 RHIC Sweep keys are RHIC Key Tree Complete indicator is RHIC Reset indicator is	CAPTURED ON OFF
REMOVE VERIFY VERIFY	The last #15 Sweep Key RHIC Key Tree Complete indicator is RHIC Reset indicator is	OFF OFF
CAPTURE VERIFY VERIFY	The last #15 Sweep Key RHIC Key Tree Complete indicator is RHIC Reset indicator is	OFF ON
PLACE VERIFY VERIFY	Peers 7, 9, 11, 13, 15, 17 in Safe Access (Mode 2) MCR sees Peers 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square is in Attempt to reset gates: 12GE1 \square , 2GE1 \square , 4GE2 \square , 6GE1 \square , 8GE2 \square , 10GE1 \square	MODE 2 FAIL
PLACE VERIFY VERIFY	Peers 7, 9, 11, 13, 15, 17 in Restricted Access (Mode8) MCR sees Peers 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square is in Attempt to reset gates: 11GS1 \square , 2GE2 \square , 4GE3 \square , 6GE2 \square , 7GE1 \square , 10GI1 \square	MODE 8 FAIL
PLACE VERIFY VERIFY	Peers 7, 9, 11, 13, 15, 17 in Controlled Access (Mode16) MCR sees Peers 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square is in Attempt to reset gates in Table – 1, below	MODE 16 SUCCESSFUL

Gate	Verify reset O.K. in Mode 16	Gate	Verify reset O.K. in Mode 16	Gate	Verify reset O.K. in Mode 16	Gate	Verify reset O.K. in Mode 16
11GS1		2GE1		6GE2		9GI1	
11GI1		2GE2		6GE3		10GE1	
12GE1		4GE3		7GS1		10GI1	
12GI1		5GS1		7GE1		XXXX	XXXXX
1GS1		5GE1		8GE2		XXXX	XXXXX
1GI1		6GE1		9GS1		XXXX	XXXXX

Table – 1: Test of the Remote Reset function from the RHIC Key tree in MCR

☐ Check for confirmation of Remote Reset function of the RHIC Key Tree from MCR

1.2 Confirm normal move to MODE 24 is possible.

	PLACE	Peers 7, 9, 11, 13, 15, 17 in Controlled Access (Model6)	
	VERIFY	MCR sees Peers 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square is in	MODE 16
	VERIFY	All gates are	RESET
	VERIFY	All Zones are	SWEPT
	VERIFY	24 ea #14 RHIC CA keys & 6 ea #15 RHIC Sweep keys are	CAPTURED
	VERIFY	RHIC Key Tree Complete indicator is	ON
	VERIFY	RHIC Reset indicator is	OFF
	VERIFY	3 ea #10 RF CA keys and 2 ea #15 RF Sweep keys are	CAPTURED
	VERIFY	RF Key Tree Complete indicator is	ON
	VERIFY	RF Reset indicator is	OFF
	VERIFY	Attempt to place Peer 7, 9, 11, 13, 15, 17 No Access (Mode 24) is	SUCCESSFUL
	PLACE	Peer 7, 9, 11, 13, 15, 17 in Controlled Access (Mode 16)	
	VERIFY	MCR sees Peer 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square in	MODE 16
	Chec	k for confirmation of normal move to MODE 24 is possible.	
1.3	Confirm RHIC	C Key Tree complete is necessary for move to MODE 24	
	PLACE	Peer 7, 9, 11, 13, 15, 17 in Controlled Access (Mode 16)	
	VERIFY	MCR sees Peer 7 □, 9 □, 11 □, 13 □, 15 □, 17 □ in	MODE 16

Key	Turn Key to OFF position	Verify Key Active light ON	Verify Reset light OFF	Verify Key Tree Complete Light OFF	Verify cannot go into Mode 24	Turn Key to ON position
1st Row -RHIC CA #1						
1st Row -RHIC CA #3						
2 nd Row -RHIC CA #8						
2 nd Row -RHIC CA #12						
3 rd Row –RHIC CA #15						
3 rd Row –RHIC CA #17						
4 th Row –RHIC CA #22						
4 th Row –RHIC CA #23						
RHIC Sweep #1						
RHIC Sweep #6						

Table – 2: Test of RHIC Key Tree Complete is necessary for move to Mode 24

 $\ \square$ Check for confirmation of RHIC Key Tree complete is necessary for move to MODE 24

FOLLOW

Table 2 below

Key1.4 Confirm in Mode	All Peers 24 femo Mode Peer ² f. 9.	Turn va ker ko OFF 11, 13, 1	Verify Key ey from Key light ON 5, 17 in No A	Verify Key Tree reempletero Light ccesQEMode	Verify all Peers proved to Mode 2 24)	Turn Mkaz 2 ON	Verify Key Active light OFF	Verify Key Tree Complete Light ON
1st Row RHYERIF¥2		s Peer 7	□, 9 □ ₉ 11 □,				MODE	24 _
1st Row -RHIC CA #4								
2 nd Row -RHIC CA #7								
2 nd Row -RHIC CA #10								
3 rd Row -RHIC CA #13								
3 rd Row -RHIC CA #18								
4 th Row -RHIC CA #20								
4 th Row -RHIC CA #21								
RHIC Sweep #2								
RHIC Sweep #5								
RF CA # 2								
RF Sweep #1								

Table - 3: Test in Mode 24 of removal of key from Key Tree will drop System to Mode 2

 $\hfill\Box$ Check for confirmation in Mode 24 removal of key from Key Tree will drop System to Mode 2

1.6 Co	nfirm Excess #15	RHIC Sweep	key at MCR will dro	p System from	Mode 24 to Mode 2
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Ш	VERIFY	24 ea #14 KHIC CA keys & 6 ea #15 KHIC Sweep keys are	CAPTURED
	PLACE	Peer 7, 9, 11, 13, 15, 17 in No Access (Mode 24)	
	VERIFY	MCR sees Peer 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square in	MODE 24
П	VERIFY	RHIC Key Tree Complete indicator is	ON
	VERIFY	RHIC Reset indicator is	OFF
	A TTEMDT	To these among #15 DIVIC Street housin Description of MCD	
	ATTEMPT	To turn excess #15 RHIC Sweep key in Reset tumbler at MCR	
	VERIFY	MCR sees All Peers moved to	MODE 2
	REMOVE	Excess #15 RHIC Sweep key from Reset tumbler	

☐ Check for confirmation of excess #15 RHIC Sweep at MCR key will drop System from Mode 24 to Mode 2

1.8 Confirm keyswitch integrity of keys in Rhic Key Tree in Mode	1.8	Free in Mode	Sev Tre	Rhic Kev	vs in R	of kev	integrity	kevswitch	Confirm	1.8
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		PLACE	Peer 7, 9, 11, 13, 15, 17 in Restricted Access (Mode 8)	
		VERIFY	MCR sees Peer 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square in	MODE 8
		FOLLOW	Table 4 below	
1.7	C	onfirm Excess	#11 RF Sweep key at MCR will drop System from Mode 24 to M	Iode 2
		VERIFY	24 ea #14 RHIC CA keys & 6 ea #15 RHIC Sweep keys are	CAPTURED
		PLACE	Peer 7, 9, 11, 13, 15, 17 in No Access (Mode 24)	
		VERIFY	MCR sees Peer 7 \square , 9 \square , 11 \square , 13 \square , 15 \square , 17 \square in	MODE 24
		VERIFY	RHIC Key Tree Complete indicator is	ON
		VERIFY	RHIC Reset indicator is	OFF
		ATTEMPT	To turn excess #11 RF Sweep key in RF Reset tumbler at MCR	
		VERIFY REMOVE	MCR sees All Peers moved to Excess #11 RHIC Sweep key from Reset tumbler	MODE 2

☐ Check for confirmation of excess #11 RF Sweep key at MCR will drop System from Mode 24 to Mode 2

Key	Verify all Peers in Mode 8	Turn key OFF	Verify Key Active light ON	Verify Key Tree Complete light OFF	Verify all Peers remain in Mode 8	Turn key ON	Verify Key Active light OFF	Verify Key Tree Complete Light ON	Go to next key
1st Row -RHIC CA #1									
1st Row -RHIC CA #2									
1 st Row -RHIC CA #3									
1 st Row -RHIC CA #4									
1 st Row -RHIC CA #5									
1 st Row -RHIC CA #6									
2 nd Row -RHIC CA #7									
2 nd Row -RHIC CA #8									
2 nd Row -RHIC CA #9									
2 nd Row -RHIC CA #10									
2 nd Row -RHIC CA #11									
2 nd Row -RHIC CA #12									
3 rd Row -RHIC CA #13									
3 rd Row -RHIC CA #14									
3 rd Row -RHIC CA #15									
3 rd Row -RHIC CA #16									
3 rd Row -RHIC CA #17									
3 rd Row -RHIC CA #18									
4 th Row -RHIC CA #19									
4 th Row -RHIC CA #20									
4 th Row -RHIC CA #21									
4 th Row -RHIC CA #22									
4 th Row -RHIC CA #23									
4 th Row -RHIC CA #24									
RHIC Sweep #1									
RHIC Sweep #2									
RHIC Sweep #3									
RHIC Sweep #4									
RHIC Sweep #5									
RHIC Sweep #6									End of test

Table - 4: Test in Mode 8 of keyswitch integrity of keys in Rhic Key Tree

□ Check for acceptance of Confirm keyswitch integrity of keys in Rhic Key Tree in Mode 8

END OF TEST PROCEDURE

TTL: Sign for completion of initial testing:	
	Date://
TTL: Sign for completion of final testing:	
	Date: / /